



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/571,248	11/20/2006	Franciscus Antonius Pronk	Vereenigde P68US0	6158

7590 08/14/2009  
Courtney N. Lapekes  
Varnum, Riddering, Schmidt & Howlett  
Bridgewater Place  
Post Office Box 352  
Grand Rapids, MI 49501-0352

EXAMINER
----------

CHRISTIAN, MARJORIE ELLEN

ART UNIT	PAPER NUMBER
----------	--------------

1797

MAIL DATE	DELIVERY MODE
-----------	---------------

08/14/2009

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/571,248	<b>Applicant(s)</b> PRONK ET AL.	
	<b>Examiner</b> MARJORIE CHRISTIAN	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 3/8/2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) 1-8 and 36 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 9-35 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-36 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Summary*

1. This is the initial Office action based on the application filed March 8<sup>th</sup>, 2006.
2. **Claims 1-36** are pending, **Claims 9-35** have been fully considered and **Claims 1-8, 36** have been withdrawn from consideration.

### *Election/Restrictions*

3. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 1-8, 36, drawn to process of making a microsieve.

Group II, claims 9-35, drawn to a microsieve with a spatial pattern of height variations in the cross flow surface.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features. Specifically, US Patent No. 4,923,608, FLOTTMANN et al. (hereinafter FLOTTMAN) discloses a similar special technical feature. The special feature disclosed as a microsieve with a cross flow surface and opposite surface with a spatial pattern of height variations in the cross-flow surface of the membrane (C2/L37-42, Claims 1, 5-6), so that in a vicinity of a majority of the pores,

Art Unit: 1797

within a distance of less than ten pore sizes from each of the pores of the majority, at least one of the height variations is present (Fig. 3b, 6a-b).

During a telephone conversation with Mr. James Mitchell on 8/3/2009 a provisional election was made with traverse to prosecute the invention of Group II, **claims 9-35**. Affirmation of this election must be made by applicant in replying to this Office action. **Claims 1-8, 36** are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

#### ***Priority***

4. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

#### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. **Claims 9-13, 15-19, 21 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,797,211, EHRFELD et al..**

As to **Claims 9**, EHRFELD discloses a microsieve provided with a membrane with a cross-flow surface and an opposite surface connected by pores between the

Art Unit: 1797

surfaces (Fig. 1, Abstract), and a spatial pattern of height variations in the cross-flow surface of the membrane (Fig. 2-4, C3/L35-42, C3/L54-C4/L3, C4/L60-C5/L3).

As to **Claims 10-13**, EHRFELD discloses that the amplitude of the height variation is approximately one pore size (Figs. 1-4) and that at a distance of less than one pore size from each of the pores a height variation is provided (C3/L35-37, Fig. 3) (**Claim 13**).

As to **Claim 15**, EHRFELD discloses the membrane on the opposite surface has height variations that run along with the height variations on the cross-flow surface (Fig. 4).

As to **Claim 16**, EHRFELD discloses the opposite surface is substantially flat, so that the height variations correspond to thickness variations in the membrane (Fig. 3).

As to **Claim 17**, EHRFELD discloses a filtering apparatus (Fig. 1, 5) provided with a first supply and drain channel (8/15) for a cross-flow of fluid, a second drain channel for drain of filtered medium (16), and a microsieve with a membrane (5) which is coupled to the first supply and drain channel, so that the cross-flow fluid flows from the first supply channel to the first drain channel along a cross-flow surface of the membrane (arrows 8/15), and is coupled to the second drain channel, so that filtered fluid can flow from the opposite surface of the membrane to the second drain channel (arrow 16), and wherein the membrane contains pores (4) which extend between the cross-flow surface and the opposite surface, as well as a spatial pattern of height variations in the cross-flow surface of the membrane (Fig. 3-4), so that in a vicinity of a majority of the pores, within a distance of less than ten pore sizes from each of the

Art Unit: 1797

pores in the majority a height variation is present (C3/L35-42, C3/L54-C4/L3, C4/L60-C5/L3).

As to **Claims 18-19**, EHRFELD discloses that the amplitude of the height variation is approximately one pore size (Figs. 1-4) and that at a distance of less than one pore size from each of the pores a height variation is provided (C3/L35-37, Fig. 3).

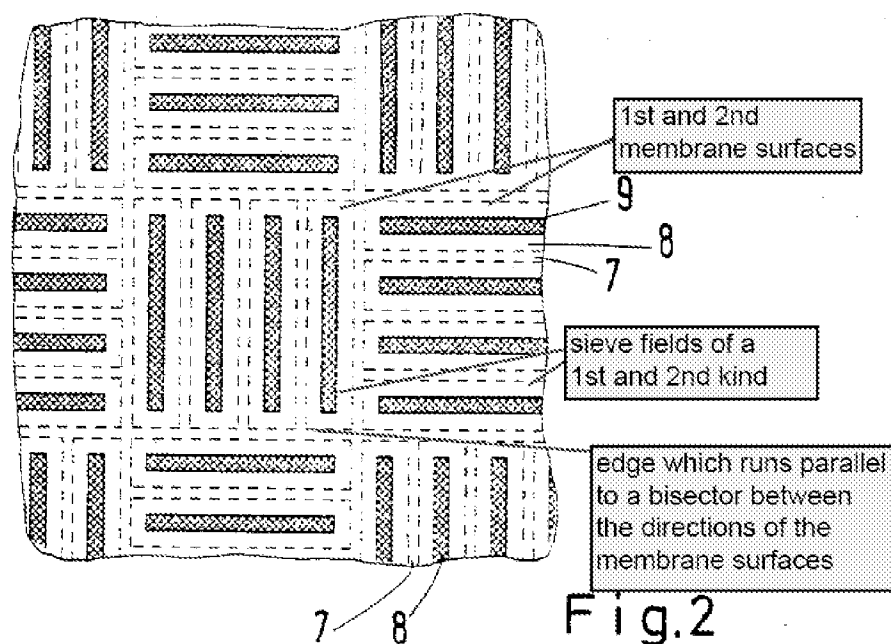
As to **Claim 21**, EHRFELD discloses the membrane on the opposite surface has height variations that run along with the height variations on the cross-flow surface (Fig. 4).

6. **Claims 22-27, 30 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 4,812,236, EHRSAM.**

As to **Claims 22, 24**, EHRSAM discloses a microsieve provided with a membrane layer and a supporting layer (Fig. 2, C3/L49-61, Fig. 2), wherein the membrane layer is divided into mutually separate first and second membrane surfaces with pores (9) in each of them, and wherein the supporting layer is structured into a supporting structure (7) that supports the membrane and has openings which correspond to circumferences of the membrane surfaces and continue to the membrane surfaces (C3/L49-61), membrane surfaces are elongate in shape (Fig. 2), and longitudinal directions of the first and second membrane surfaces run parallel to the respective first and second membrane surfaces, and the angle between the longitudinal directions is between 45 and 135 degrees (Fig. 2).

As to **Claim 23**, EHRSAM discloses the first membrane surfaces are situated in line with each other, and between successive first membrane surfaces, groups of second membrane surfaces are situated (Fig. 2).

As to **Claims 25-27**, EHRSAM discloses sieve fields of a first and second kind containing exclusively either first or second membrane surfaces, the sieve fields have the shape of a parallelogram, the membrane surfaces are parallel to each other and extend from a first edge to a second edge and adjacent sieve fields are different and the parallelograms have an edge that runs parallel to a bisector between the longitudinal directions of the first and second membrane surface (Fig. 2).



As to **Claim 30**, EHRSAM discloses the microsieve and that it is used for transverse current filtration (C1/L7-9). The limitation with respect to the microsieve's position during use is a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from

Art Unit: 1797

a prior art apparatus” as the prior art apparatus teaches all the structural limitations of the claim. *Ex parte Masham*, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. **Claims 14, 20 are rejected under 35 USC 103 (a) as being obvious over US Patent No. 4,797,211, EHRFELD et al. in view of US Patent No. 5,753,014, VAN RIJN.**

As to **Claims 14, 20**, EHRFELD discloses the microsieve with the membrane having pores with a height variation as shown in the 102(b) rejection of **Claims 9, 17**. EHRFELD does not appear to expressly disclose that the opposite surface of the membrane has supporting structures. However, VAN RIJN discloses that against the opposite surface of a membrane, supporting structures are present which leave the



Art Unit: 1797

membrane clear over a part of the opposite surface in which the majority of the pores are situated (Fig. 12a, 14b, 15a and 15b).

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the membrane structure of EHRFELD to include the supporting structure on the opposite surface of VAN RIJN. The motivation would have been to improve the structural integrity of the membrane so that it will last longer and increase the quality of the filtration. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

8. **Claims 28-29 are rejected under 35 USC 103 (a) as being obvious over US Patent No. 4,812,236, EHRSAM in view of US PGPub 2003/0100136, DOUGHERTY.**

As to **Claims 28-29**, EHRSAM discloses the supporting structure and membrane surfaces of the microsieve as shown in the 102(b) rejection of **Claim 22**. EHRSAM does not appear to expressly disclose that the supporting structure is silicon crystal. However, DOUGHERTY discloses that the supporting structure contains silicon dioxide (Para. 32, 37) where it is implicit that the longitudinal direction of the membrane surfaces run parallel to the planes of the crystal as otherwise the strength of the support and membrane would be greatly reduced and the support would be more likely to crack or break, absent evidence to the contrary. Further, the recitation “that etches minimally in an anisotropic etching process operation on the supporting structure” is a “recitation with respect to the manner in which a claimed apparatus is intended to be employed

Art Unit: 1797

and does not differentiate the claimed apparatus from a prior art apparatus” as the prior art apparatus teaches all the structural limitations of the claim.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the support of EHR SAM to include the silicon crystal of DOUGHERTY. The motivation would have been to improve the durability and quality of filtration of the microfilter by using a material (silicon crystal) that has better structural integrity. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

9. **Claims 31-35 are rejected under 35 USC 103 (a) as being obvious over US Patent No. 4,812,236, EHR SAM in view of US Patent No. 4,797,211, EHRFELD et al..**

As to **Claim 31**, EHR SAM discloses the microfilter with a supporting structure and first and second membrane surfaces as shown in the 102(b) rejection of **Claim 22** but does not appear to expressly disclose the clamping plate against the microsieve. However, EHRFELD discloses a clamping plate (Fig. 7, Ref. 40/41, see also Fig. 5) which is clamped against the microsieve (43), provided with protrusions (53) in a plane parallel to the membrane surfaces which form linear structures that extend at an angle different from zero relative to the longitudinal directions of membrane surfaces.

At the time of the invention, it would have been obvious to one of ordinary skill in the art to modify the microfilter of EHR SAM to include the clamping plate of EHRFELD, as EHR SAM does not appear to expressly disclose the structure containing the

Art Unit: 1797

microfilter. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

As to **Claim 32**, EHRFELD discloses the clamping plate is provided with a drain opening (52).

As to **Claim 33**, EHRFELD discloses a plurality of supply openings (Fig. 5, Ref. 32) and a plurality of drain openings (22, 33, 34) in the clamping plate (20/21) between each pair of successive linear structures (22, 23, 24) the supply openings and drain openings are provided.

As to **Claim 34**, EHRFELD discloses the supply (Fig. 5, Ref. 32) and drain openings (34) are positioned in the clamping plate (20/21) such that imaginary connecting lines between the supply and drain openings make angles different from zero with the longitudinal directions of the membrane surfaces.

As to **Claim 35**, EHRSAM discloses the supporting structure and microsieve (Fig. 2) but does not appear to expressly disclose the drain opening and clamping plate. However, EHRFELD discloses a clamping plate (1, 10, 49, 48) against the microsieve provided with a drain opening (16, 52) that (16, 52) extends through the clamping plate at an angle normal to the surface of the filter plate (Fig. 2, 7) on the opposite side of the supply opening.

### **Conclusion**

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARJORIE CHRISTIAN whose telephone number is

Art Unit: 1797

(571)270-5544. The examiner can normally be reached on Monday through Thursday 7-5pm (Fridays off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Kim can be reached on (571)272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Krishnan S Menon/  
Primary Examiner, Art Unit 1797

MC